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No. 47

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CONTENTS

AIR

Results of First Il-86 Flights
(GRAZHDANSKAYA AVIATSIYA, Apr 81) 1

Projection for Aeroflot
(N. Momot; GRAZHDANSKAYA AVIATSIYA, Apr 81) 9

MOTOR VEHICLE

Motor Vehicle Transportation Needs National Coordinating Body
(L. I. Kolesov; EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA, No 4, 1981) 13

Briefs

Northern Construction Cost 19
Large Scale Dump Truck 19

RAILROAD

BAM Plans, Progress in Buryatiya
(V. Biryukov; AGITATOR, Feb 81) 20

Finnish Press: Finland-USSR Electric Locomotive Project
(HUFVUDSTADSBLADET, 7 Apr 81) 23

OCEAN AND RIVER

Georgian SSR Develops Continuous, Coordinated Planning for Transportation
(V. Lavruk, Yu. Lukasik; VODNYY TRANSPORT, 25 Apr 81) ... 25

Coordinating Automation in Design and Production Stages
(L. D. Voytasik, N. M. Pinevskiy; SUDOSTROYENIYE, Feb 81) 31

Omsk Port Workers Face Supply Problems for Ship Repair Work
(V. Rogozin; VODNYY TRANSPORT, 26 Mar 81) 35

Problems With Cargo Handling at Arctic Ports
(V. Speranskiy; VODNYY TRANSPORT, 28 Mar 81) 36

Briefs

'Sibir' on Duty 39
River Ports Open 39
Navigation Begun 39
Harbors of Siberia 39
End of Antarctic Expedition 40
Transport Problems 40
Lighter Carrier 40
New Asian Line 41

AIR

RESULTS OF FIRST IL-86 FLIGHTS

Moscow GRAZHDANSKAYA AVIATSIYA in Russian No 4, Apr 81, pp 14-19

[Article: "New Equipment of the 11th Five-Year Plan: A Large Ship--A Large Road Ahead (The Il-86: Experience of First Flights)"]

[Text] The first Soviet wide-body passenger aircraft, the Il-86, which took its start at the end of last year, is successfully operating for the 11th Five-Year Plan. The mastery and adoption of this fundamentally new aircraft became a bright page in the grand annals of Soviet civil aviation. Its arrival in airlines solved one of the important tasks of scientific-technical progress set for the Aeroflot collective by the 25th Communist Party Congress.

How did the preparation of the largest liner of our air routes for regular flights take place? What is the specific nature of its flying, technical and commercial operation? What practical conclusions can be drawn from the experience of the first flights?

These questions were the subject of a roundtable discussion held by the journal's editors in the Order of Lenin Moscow Administration of Transport Aviation of Civil Aviation. Taking part in the discussion were Administration Chief V. P. Yudashkin; Deputy Administration Chief for Political Indoctrination Work V. I. Maryganov; Deputy Chief Engineer A. A. Yemtsov; Chief of the Vnukovo Production Association G. F. Andreyev; Pilot 1st Class V. P. Korniyuk, commander of a subunit of Il-86 aircraft; Deputy Subunit Commander for Political Indoctrination Work V. N. Demakin; airship commander and Pilot 1st Class V. A. Kalimanov; copilot and Pilot 1st Class G. D. Lar'kin; 1st Class Flight Engineer V. K. Senokosov; Senior Member of Flight Attendants Team T. I. Bazarova; and flight attendants I. L. Vishnyakova and N. P. Yershova.

We publish a brief recording of the discussion.

Viktor Petrovich Yudashkin, chief of Moscow Administration of Transport Aviation: "Our collective has had more than one occasion to perform responsible assignments involving important milestones in civil aviation's development. A quarter-century ago, in 1956, it had the great honor to put Aeroflot's firstborn jet into operation--the high-speed multiseat Tu-104 airship. This aircraft opened up a new era in air transportation--an era of mass passenger travel using jet technology. Subsequently the workers of the Mosow Administration of Transport Aviation also had occasion to give a start in life to other aircraft with gas-turbine engines, which held a leading position both on intra-Union and international airlines. And we were understandably proud of the fact that, with consideration of the abundant labor traditions and mature experience of the collective, the Ministry of Civil Aviation assigned us to master and introduce the Il-86 aircraft.

According to its design and performance data, the Il-86 is a qualitatively new aircraft differing substantially from its predecessors. I will not go into detail, but will stress only that its transport capabilities are enormously higher than our basic mainline aircraft. It surpasses the Tu-134 in passenger capacity by fivefold, the Tu-154 by a little over twofold and the Il-62 by almost twofold. The aircraft is fitted with the latest special equipment, and unique technical facilities used for the first time in our practice have been developed for its servicing on the ground. The performance of service tests of the Il-86 and its placement in operation naturally required much effort on our part.

The cream of the crop was chosen for working on this aircraft. Crews were formed from flight development personnel with a higher education, long flying hours in heavy transport aircraft, and high moral-political qualities. A separate Il-86 flight subunit was set up at the Vnukovo Production Association. Technical personnel being trained for servicing them were associated in a specialized shop. An Il-86 laboratory was set up for diagnostics and flaw-detection of aviation equipment, and groups of flight attendants, baggage handlers, and motor transport workers were formed.

The aircraft's design was studied and flight and ground personnel were trained at the OKB [Special Design Bureau] imeni S. V. Il'yushin and at the aircraft construction plants, while the study of its engine, instruments, electronics and radar equipment took place in our administration's training subunit. Aeroflot's scientific research organizations--GosNII [State Scientific Research Institute] and GosNII ERAT [expansion unknown]--gave the collective daily help. Technical flying conferences were convened regularly with the participation of representatives of interested ministries and departments, where results of the work which had been done were discussed and steps outlined for remedying deficiencies.

The entire course of mastering the Il-86 took place under the constant monitoring of the Aeroflot management. The advice and instructions of Minister of Civil Aviation Chief Mar Avn B. P. Bugayev, one of the pioneers in introducing jet technology on the air routes, contributed to the successful conclusion of service testing of the new aircraft. After two technical trips of the Il-86 had been flown and analyzed, it began carrying passengers on the Moscow-Tashkent air line in late 1980."

Viktor Il'ich Maryganov, deputy administration chief:"The purposeful political indoctrination work organized in the Moscow Administration of Transport Aviation and particularly in the Vnukovo Association played a large part in accomplishing this responsible and honorable assignment. Managers and party and political workers gave briefings and held discussions among the personnel about the Il-86 aircraft and urgent tasks facing us in connection with its mastery. An explanation was given to all labor collectives that the participation of their representatives in accomplishing these tasks was a matter of honor. Each candidate for work on the Il-86 was discussed in party, trade union and Komsomol organizations, and examined and approved by the administration's mandate commission. Cadres of all specialties capable of guaranteeing the successful mastery and introduction of the new aircraft were selected thanks to such a scrupulous approach.

The department of political indoctrination work drew up a congratulatory certificate handed out to all personnel of the Il-86 subunit together with the order assigning them to a position. The send-off of crews on an independent flight took place in a ceremonial atmosphere. Congratulations also were received by the flight attendants, specialists of the technical aviation facility, and workers of the shipments' organization service and of other services permitted to service this aircraft. Socialist competition unfolded broadly for high quality in conducting the Il-86 service tests and for participation in making its first passenger flight. This was considered an important component of socialist competition of the capital's aviation workers aimed at a successful conclusion to the 10th Five-Year Plan and for a worthy greeting to the 26th CPSU Congress. It is gratifying to acknowledge that our collective kept its word honorably."

Viktor Petrovich Korniyuk, flight subunit commander: "It has already been mentioned here that the Il-86 differs from its predecessors by its large size. As a matter of fact, this is an enormous aircraft: It is almost 60 m long, with a wing span of 48 m, a height of 15.5 m, and fuselage diameter of 6 m. For comparison I will note that the diameter of the Moscow subway tunnel is a half-meter less. The aircraft's maximum take-off weight with full load is around 206 tons.

Despite such impressive dimensions and weight, the Il-86 has excellent performance characteristics. It requires no special conditions for take-off and landing, and it can use ordinary airfields which service, for example, the Il-62 and Tu-154 aircraft. The flight range of the Il-86 is from 3,600 to 5,800 km depending on the amount of the commercial load. Its cruising speed at an altitude of 9,500-10,000 m is 850-950 km/hr.

How have the basic technical requirements placed on the Il-86 during its design period been achieved? This was facilitated by a large number of progressive design decisions. The aircraft is fitted with four NK-86 by-pass jet engines created in the design bureau headed by General Designer and Academician N. D. Kuznetsov, Hero of Socialist Labor. The engines are accommodated on pylons under the wings. The take-off thrust of each of them, equal to 13 tons, is kept constant at ambient air temperatures up to +30 degrees. Grid-type reversers with deflecting flaps are installed in the rear part of the engines.

The design envisaged the possibility of using the Il-86 on airfields with relatively small runways approximately 2,600 m long and 45 m wide. Powerful high-lift devices--leading-edge slats, triple-slotted flaps, spoilers, and brake flaps--have been used to provide the aircraft's high take-off and landing qualities. Because of this the take-off run with full take-off weight is not over 1,200-1,500 m. The

Il-86's landing speed is somewhat lower than for aircraft of other types, being 260 km/hr. The landing run is 1,100-1,200 m.

The aircraft's landing gear is made in a tricycle arrangement to reduce the load on the runway. The main left and right "legs" are attached to the wings, with the middle one attached to the fuselage. All of them have four-wheel bogies. The first two wheels on the middle "leg" turn freely for giving the aircraft maneuverability. All wheels are provided with tubeless tires with 16 cord plies, which gives them increased strength."

V. P. Yudashkin: "It has to be considered that the Il-86 has powerful engines in a low position. For this reason constant care must be taken to ensure that the runways, taxiways and ramp are in good, clean condition. Otherwise it is possible that there will be damage to the concrete pavement or engine power plant."

Viktor Aleksandrovich Kalimanov, airship commander: "The Il-86 is in all respects the new word for our science and technology. Let's take the flying and navigation equipment for example. It makes it possible for the crew, consisting of only three persons (commander, copilot and flight engineer), to fly in the most difficult meteorological conditions. We immediately began flying in this aircraft under the first category of the International Civil Aeronautics Organization [ICAO]. And the Il-86 generally already has been certified for flying under the ICAO 2d category.

The aircraft's latest flying and navigation equipment consists of three systems: air-speed parameters, flying equipment, and base navigation equipment. The first system puts out information on the values of relative and true flight altitudes, indicated and true speeds, Mach number, deviations from a given flight level, ambient air temperature and a number of other data used for automatic control. The second system is intended for control of the aircraft in all stages of the flight as selected by the crew--automatic, semiautomatic or manual.

The third, base system includes a navigation computer. This essentially is an onboard electronic computer into which the program of a future automatic flight along a specific route with consideration of designated alternate airports and landing-approach formats, drawn up by a preparatory navigation group on the ground, is entered. The onboard electronic computer itself, without crew intervention, computes the aircraft's coordinates, corrects its course, displays the values of current navigation parameters, and puts out signals for automatic control in the horizontal plane. The complex also has course and vertical systems, a short-range navigation and landing system, Doppler for measuring speed and drift angle, needed for air navigation. This is accomplished faultlessly and with high precision.

After take-off, the crew practically is left only with monitoring the work of automatic instruments throughout the entire flight and taking over the controls only during the landing. This of course considerably simplifies and facilitates the crew's work."

V. P. Yudashkin: "But there is also a special feature here. I have in mind the landing itself. In comparison with our other aircraft, the Il-86 cockpit is located in a rather high position. One has to practice eye estimation so a rough landing does not occur after leveling off the aircraft above the runway."

Gennadiy Danilovich Lar'kin, copilot: "It is physically easy to control the Il-86. This is achieved with the help of nonreversible hydraulic rudder drives (boosters), which transfer the pilots' control actions to the performing units and multiply the force many times over. The stabilizer, flaps, leading-edge slats and brake flaps are deflected in this manner. Redundancy of these drives increases their operating reliability.

Nevertheless, with all the saturation of the Il-86 with automatics, certain loads have increased substantially on its crew. For example, the captain constantly has to keep an eye on the radios and radar. Navigator's duties, in particular monitoring the course covered, have fallen on the copilot. The flight engineer, who previously basically devoted attention to the engines' operation, now monitors the aircraft's entire energetics. Each flight requires thorough preparation, precise coordination of crew members in the air and comprehensive caution and reaction speed in those instances where it becomes necessary to back up the work of the onboard equipment."

Vladislav Konstantinovich Senokosov, flight engineer: "Although it has to be said that all the Il-86's equipment worked reliably. A single malfunction of some unit, device or instrument cannot lead to troubles in the engines, power systems or control systems, since their back-ups immediately are switched in. Triple and even quadruple redundancy is introduced in the most responsible sectors.

Moreover, a system of early technical diagnostics has been provided in the aircraft. Its purpose is to suggest to the crew where to expect the appearance of malfunctions. This permits taking the necessary preventive steps ahead of time.

Flying hours on the Il-86 were high during the intensive service tests, approaching 250-260 hours per month. But not one equipment malfunction complicating a flight occurred. It stands to reason that this also was the result of its capable operation on the part of our flight and technical engineering personnel."

Viktor Nikolayevich Demakin, deputy subunit commander: "Flying specialists with abundant production experience and thorough technical knowledge are at the controls of the Il-86. The captain of this airship, Party Member V. A. Kalimanov, has long flying hours aboard aircraft which came out of the Design Bureau imeni S. V. Il'yushin, a higher education, and high moral-volitional qualities. Airship Captain A. S. Kaledin, who heads the subunit party organization; copilot G. N. Lar'kin, chairman of the shop trade union organization; Flight Engineer V. K. Senokosov and our other aviation workers can be described in exactly the same manner. All of them realize the serious job they have been assigned and are striving to justify the trust placed in them by selfless work."

Aleksandr Aleksandrovich Yemtsov, deputy chief engineer: "When cadres of technical engineering personnel were put together for servicing the Il-86, we concluded that the optimum variant was to combine experience and young cadres. Life has confirmed the correctness of this principle. Our veterans, through whose hands more than one jet aircraft has passed, understood the general design of the new aircraft better and faster. And for their part, the young people who recently came to us from schools and universities understood the wisdom of various innovations--and there were quite a few--more successfully.

For example, electronic systems for controlling engines and brakes, for turning wheels of the middle "leg," for air-conditioning and regulating pressure in the cockpit and passenger cabins have been installed in this aircraft. An effective electric-impulse anti-icing system has been installed. A nonflammable hydraulic fluid is used. Aircraft control processes have been automated using electronics. And all this has to be known by heart, as they say, and ensure the reliable operation of each component, unit and instrument.

At first we set up one shop for the Il-86's technical servicing, headed by a highly qualified engineer, V. A. Khokhlov. Later, when regular passenger flights of this aircraft opened up and the amount of work increased, we set up two shops working around the clock--an operations shop and a labor-intensive servicing shop. And we also carried out a narrower specialization of the work teams than was customary previously. We set up independent teams for power plants, airframe and fuel systems, high-altitude equipment and water-supply system, aircraft control, hydraulic system, and electrical equipment. This also produced positive results and contributed to an increase in labor productivity and the quality of work performed.

The labor-intensiveness of Il-86 maintenance proved somewhat higher than for our other heavy transport aircraft. On the other hand, the very process of servicing was substantially simplified. How? Chiefly through the various instrumentation provided on this aircraft for monitoring equipment status. Mobile benches hooked to aircraft power plants and systems automatically register defects which have appeared. Remedying the defects is reduced to a replacement of faulty parts or entire articles.

We presently are developing an automated maintenance control system for the new aircraft--"Prognoz-86"--in our computer center facility. Technical diagnostics of the Il-86's serviceability will be performed with its help and corresponding data sent to displays for technical engineering personnel."

Gennadiy Fedorovich Andreyev, chief of Vnukovo Production Association: "The organization of commercial servicing of the Il-86 also was a complex problem. Together with the design bureau, the Civil Aviation GosNII and the Shipments' Organization Administration, we had to think out down to the smallest detail the entire servicing cycle. Full-scale practices were held and an organizational structure was arranged. Just how does all this look now?

On arriving at Vnukovo Airport, passengers for the Il-86 proceed through the old terminal into the new building built onto it. There they register airline tickets, surrender baggage, which is loaded in containers, and receive a boarding pass--red, blue or yellow, depending on their seats in one of the three aircraft cabins. They proceed with personal articles to the passenger lounge corresponding to ticket color and go from there to the aircraft on a bus. On ascending the ramp to the lower deck, the passengers leave personal articles on shelves there, then ascend to their cabins via the inner stairs and take their allocated places. Meanwhile, the baggage placed in containers is transported and loaded in the aircraft's cargo compartment. Baggage and articles of late passengers are accommodated on the lower deck.

With this technology the commercial servicing of the Il-86 lasts no longer than the time period established for these purposes. Moreover, since the aircraft has three boarding ladders the processes of emplaning and deplaning passengers are faster and more efficient."

V. P. Yudashkin: "And to ensure that there is no extra fuss preparing for the Il-86's flight, involving its receiving fuel, special fluids and water or its technical and commercial servicing, we introduced the position of senior dispatcher-manager. As a plenipotentiary representative of the association's production-dispatcher service, he is at the aircraft in a vehicle equipped with intra-airport intercom and directs the work of all services. Precise order on the ground is a guarantee of good passenger services aboard the aircraft as well."

Tat'yana Ivanovna Bazarova, flight attendant group leader: "We flight attendants see to it that passengers feel as comfortable as at home on each flight aboard the Il-86. This is aided by the soft, comfortable seats of new design, overhead lighting which does not shine in the eyes, an improved ventilation system, and the opportunity of using the services available in flight--from eating a hot meal to acquiring souvenirs."

Nadezhda Prokhorovna Yershova, flight attendant: "We flight attendants are also very happy with the new aircraft. Its galley is divided into two compartments, which speeds up the preparation of the onboard meal for serving. We do not carry it, but serve it from mobile carts. We also have an aircraft intercom using portable consoles."

Inna Leonidovna Vishnyakova, flight attendant: "I will also note that mutual supervision, back-up and interchangeability are especially necessary aboard the new aircraft. The fact is that there are many people aboard, and although they are served by a team of 12 flight attendants, one cannot always go somewhere or to someone in time. Much here depends on the team leader. If she has the qualities of a genuine organizer, as does Tat'yana Bazarova, you can be sure that there will be no dissatisfied passengers."

V. P. Yudashkin: "We have told briefly here about the first steps of the Il-86 aircraft. The experience of its flights still is limited, but even now we can state that it carries many new things into aviation transportation. Much is being worked out aboard the first domestic wide-body aircraft that in time will become a standard of flight, technical and commercial operation for us and will contribute to Aeroflot's transformation into a standard in transportation.

The Il-86 has the development of new air routes ahead of it. They will be laid out from Moscow to Mineral'nyye Vody, Alma-Ata, Novosibirsk, Sochi, Simferopol' and other major cities in the country. Aeroflot's largest airship is destined to have a great career and a great road ahead."

PHOTO CAPTIONS

1. pp 14-15. Participants of the roundtable discussion. In the center is V. P. Yudashkin, chief of the Order of Lenin Moscow Administration of Transport Aviation of Civil Aviation.

2. pp 16-17. Il-86: Length--59.54 m
Height--15.5 m
Wing span--48.06 m
Number of passengers--350
Maximum payload--42 tons
Flight range (depending on payload)--3,600-5,800 km
Optimum flight altitude--9,500-10,000 m
Cruising speed--850-950 km/hr
Power plant--4 NK-86 turbofan engines
Take-off thrust of each engine--13 tons

Aircraft equipped with: Automated control systems
Effective anti-icing system
Reversers and noise suppressors
Powerful air-conditioning system

3. pp 18-19. Servicing the Il-86 aircraft at the Vnukovo Technical Aviation Facility is entrusted to specialists of the highest qualification. From left to right: Work on the aircraft's auxiliary power plant is being performed by Aviation Technician N. Krylov, Senior Engineer V. Andreyev and Aviation Technician A. Korshunov.

Yu. Lugovtsov, one of the leading dispatchers of the air traffic administration of the Vnukovo Production Association. A recent graduate of the Riga Technical Flight School, he now supports flights of modern jet aircraft, including those such as the Il-86.

The new facilities of the reconstructed Vnukovo Air Terminal. Passengers heading for boarding of the Il-86 are greeted hospitably by V. Solnyshkina (on left), duty attendant of the shipments' organization service, and Senior Duty Attendant T. Korobova, the section's trade-union organizer.

4. pp 16-17. Tashkent Airport. An Il-86 airship arriving from Moscow in the capital of Uzbekistan on a regular flight is being prepared for dispatch on the return trip.

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AIR

PROJECTION FOR AEROFLOT

Moscow GRAZHDANSKAYA AVIATSIYA in Russian No 4, Apr 81 pp 10-11

[Article by N. Momot, chief of Administration for Shipments' Organization of MGA [Ministry of Civil Aviation]: "Aeroflot: Levels of Growth: New Scales of Air Shipments"]

[Text] The "Basic Directions of the USSR's Economic and Social Development for 1981-1985 and for the Period up to 1990," adopted by the 26th Congress of the Communist Party of the Soviet Union, define the all-encompassing, purposeful program for our country's confident movement along the path of building communism. This program sets aside a large role for the transport system and air transportation in particular. The development of a network of airports on main lines and local airlines will be continued on the basis of scientific-technical progress in order to satisfy more fully the demand of the populace and sectors of the national economy for air shipments, especially in regions of the Far North, Siberia and the Far East. It is planned to increase passenger transportation by 1.3 times.

Just how will these problems be resolved in practice?

The build-up in volumes of air transportation work in the 11th Five-Year Plan will preserve the basic trends of the previous Five-Year Plan. Considerable attention will be given to developing lines of heightened year-around demand with the greatest passenger flows. These are routes between Moscow, capitals of the union republics, and major industrial and cultural centers, as well as between them and the city-resorts of the North Caucasus, the Black Sea coast and the Baltic. The frequency of flights will increase on these lines, which will permit a reduction in the stress on air shipments, chiefly in the spring-summer period, and an increase in the level of passenger services.

The developing northeastern regions, which are far from the country's western part, will become another zone for the further growth of shipments, and a vast one. A number of new lines will open up here. Existing long-distance air routes will be straightened where possible. Preference is given to the nonstop and the direct trips most convenient for the passengers.

The increase in volumes of air shipments in remote and inaccessible regions will exceed the average indicator for the sector. For example, air shipments in

Tyumenskaya Oblast in the 11th Five-Year Plan will increase by almost 30 percent in comparison with the 10th Five-Year Plan, and by 25 percent in Krasnoyarskiy Kray, by 25 percent in Magadanskaya Oblast, and by 20 percent in Eastern Siberia.

The Il-62 aircraft holds the leading place on our long-distance air routes. Such air routes of considerable distance as Moscow-Petropavlovsk-Kamchatskiy, Leningrad-Khabarovsk, Kiev-Khabarovsk, and Khabarovsk-Tashkent have been set up lately on aircraft of this type. Since December of last year the Il-62 aircraft have been making regular nonstop trips over the Moscow-Magadan line. In the 11th Five-Year Plan many other cities will begin to receive them. The Il-62 aircraft will connect Moscow with Noril'sk, Yakutsk, Yuzhno-Sakhalinsk, Vladivostok, Krasnoyarsk, Bratsk and Karaganda; Khabarovsk with Novosibirsk, Alma-Ata and Frunze; Novosibirsk with Magadan, Simferopol' and Odessa; and Krasnoyarsk with Vladivostok, Kiev and Simferopol'.

The Tu-154 aircraft will become even more widespread. They will arrive not only on the main lines, but also on some internal airlines such as the Magadan-Anadyr' and the Magadan-Pevek routes. By the end of the Five-Year Plan the Tu-154 will have 43.1 percent of the total volume of shipments.

Along with this, new aviation technology of the 11th Five-Year Plan will be in operation on the air routes--the 350-seat Il-86 and the 120-seat Yak-42, which began carrying passengers at the end of last year. In addition to Tashkent, the Il-86 will begin flying to Mineral'nyye Vody, and then to a number of other cities as well--Leningrad, Alma-Ata, Novosibirsk, Rostov-na-Donu, Odessa, Sochi and Simferopol'. The Yak-42 aircraft flying between Moscow and Krasnodar will begin to make regular trips to Kherson, Poltava and Nal'chik in the near future.

Local airlines also will not remain aloof from scientific-technical progress. The comfortable L-410 passenger aircraft produced by industry of the Czechoslovak Socialist Republic came to the short-distance route in a number of Aeroflot administrations back in the 10th Five-Year Plan. Aviation workers of the Magadan enterprise of the Yakutsk Administration gave this aircraft a ticket to the sky. The L-410 aircraft will be registered with more than 20 civil aviation administrations in the 11th Five-Year Plan. The comfortable An-28 will be another new passenger aircraft on local airlines.

The Il-76 cargo aircraft successfully mastered by aviators of the Tyumen' and Krasnoyarsk administrations will be used more intensively. This year they will begin operating in the East Siberian Administration. The An-12 and An-26 cargo aircraft will be working side by side with them. Aviation enterprises will be augmented with means for mechanizing loading and unloading operations. In 1981 alone there will be delivery of 152 vehicles with hoistable beds, 62 ramp buses, 35 automatic conveyors, 40 mobile ramps, 400 baggage carts, 40 automatic elevators and much more equipment. Subsequently the enterprises will receive the recently developed self-propelled loaders of long and heavy cargoes (up to 20 tons) and special vehicles for transporting containers and pallets to aircraft.

The new equipment and reinforcement of the material and technical base of our air transportation will permit carrying 106 million persons, 2.6 billion tons of cargoes and 425,000 of mail in 1981. By 1985 these figures will rise to 119 million persons, 3.1 billion tons of cargo and 460,000 tons of mail respectively.

It is planned to place in operation during the Five-Year Plan some 15 air terminals and passenger service complexes. For example, a new air terminal with a capacity of 1,500 passengers per hour will be placed in operation in Khabarovsk. Large passenger pavilions will open in Chita and Krasnoyarsk. An air terminal will be placed in operation in Yerevan designed to serve 2,100 passengers per hour, one in Minsk (1,800 passengers per hour), in Groznyy (600 passengers per hour), Semipalatinsk and Nikolayev (400 passengers per hour each) and a number of other cities in the country. Construction will begin on contemporary air terminal complexes in airports in the cities of Mineral'nyye Vody, Sochi, Ashkhabad and Baku.

The transfer of a former international air terminal in the Sheremet'yevo-1 Airport to passengers of intra-union lines taking off for Leningrad, Tallinn, Riga, Palanga, Kaliningrad and Murmansk was an important event for Muscovites and guests of the capital. With the beginning of 1981 new flights were added to these--to Arkhangel'sk, Brest, Grodno, Vorkuta, Nar'yan-Mar, Syktyvkar and Ukhta. Subsequently it is planned to make 100 flights daily from this airport over intra-union airlines and send off up to 10,000 passengers.

The construction of new Aeroflot agencies in the 11th Five-Year Plan will be accomplished chiefly in developing regions. The network of airline ticket offices will become more far-flung. Some 400 ticket offices will be added to the present 7,400.

The "Sirena" automated system for sale of airline tickets and for reserving seats on aircraft will see further development. During its operation over 70 million airline passengers have used its services. It has been converted to a machine base using third-generation electronic computers. This more than doubled the speed of making out airline tickets and increased the level of automation of their sale to 93 percent.

An even more sophisticated unionwide automated system for controlling the sale of tickets and reserving seats on aircraft--the ASU-5--is being created. Its first section, with control center in Moscow, will begin operation this year and will serve up to 20 million passengers per year.

The largest section in Aeroflot for taking telephone orders for airline tickets with their subsequent home delivery will be accommodated in a building being especially built in Moscow on Novokirovsk Prospekt. Such kinds of services as the sale of airline tickets with date of a return flight will be offered more widely. While this form of service was the practice in 800 cities and populated points in the country in the last Five-Year Plan, their number will rise to 1,300 in the current Five-Year Plan.

Considerable attention is devoted to equipping airports with information and reference facilities. In addition to the "Sinar," "Avia" and UTs-1 passenger information systems, a number of Aeroflot enterprises will receive new, improved VP-2L systems and integrated, automated information-reference systems developed on the basis of the "Vizinform" displays, as well as the fundamentally new "TELESIN" aircraft seat availability index. It is planned to set up a special information-reference service of civil aviation for the purpose of better organizing this work.

One of the tasks of increasing airline service lies in bettering the system of professional training of aviation worker cadres and, above all, of those who are directly connected with passenger services. Aeroflot has given this important problem much attention. For the seventh year now the Leningrad Aviation Technical School has been functioning, producing well-trained specialists for travel organization services. In addition, the Kiev Institute of Civil Aviation Engineers, where specialization has been introduced in the organization and planning of commercial work, trains highly qualified cadres. It is impossible to ignore such a widespread form of personnel training and preparation as the short courses under the training subunit of our administrations.

As in past years, workers of the shipments' organization services are taking an active part in public competitive reviews conducted in the sector, aimed at increasing the quality of serving passengers and the clientele, and in contests of professional expertise. Socialist competition unfolded widely for fulfillment and overfulfillment of established air shipment plans, for transforming Aeroflot into a standard in transportation, and for successful implementation of tasks set for our sector by the 26th Congress of the Communist Party of the Soviet Union.

Dynamics of Development in 11th Five-Year Plan

Category	1981	1982	1983	1984	1985
Passenger turnover (billions of passenger/kilometers)	168	177	187	198	210
Passengers (millions of persons)	106	108.5	111.5	115	119
Cargoes (thousands of tons)	2,600	2,700	2,800	2,900	3,100
Mail (thousands of tons)	425	432	440	450	460

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MOTOR VEHICLE

MOTOR VEHICLE TRANSPORTATION NEEDS NATIONAL COORDINATING BODY

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 4, 1981 pp 61-67

[Article by L. I. Kolesov, candidate of economic sciences, Institute of the Economics and Organization of Industrial Production of the Siberian Department of the USSR Academy of Sciences, Novosibirsk: "Truck Transportation — Management Problems"]

[Excerpts] The more pressing the shipping problem becomes, the more urgently necessary it is to develop a target program to produce motor vehicles, operate them, develop allied sectors, and balance the entire transportation system in the country.

A distinctive feature of motor vehicle transportation is the fact that more than 80 percent of the vehicles are operated by nontransportation enterprises. In certain oblasts of Siberia this figures exceeds 90 percent. Therefore, we cannot limit ourselves to figures on the work of general-use transportation to evaluate its role.

The freight turnover of motor vehicle transportation is roughly one-sixteenth of the turnover of all other forms of transportation taken together, but the volume of motor vehicle shipping is four times greater than that of all other forms. If the work of transportation is evaluated by the amount of turnover, which is the conventional approach, it may appear that motor vehicles do not play a significant part in the country's transportation system. It seems to us that this approach is ill-suited to raising the efficient operation of transportation. It is important to the national economy that all goods produced be delivered to the customer. The indicator of shipping volume in tons corresponds better to this task. Obviously, if one ton of some kind of freight is not delivered, the loss to the national economy will be the same regardless of the distance that this freight was to be shipped.

It should be observed that the rate of growth of motor vehicle shipping in our country cannot be considered satisfactory. In the last 20 years the share of motor vehicles in freight turnover for all forms of transportation has risen only from 5.2 to 6.2 percent. At the same time, in the United States motor vehicles account for 22 percent of the country's domestic freight turnover, while in Great Britain it is 65 percent and in West Germany, France, and Japan about 40 percent. While the freight turnover of all forms of transportation in the USSR is 30-35 percent greater than in the United States (and railroad freight turnover is 2.75 times greater), the turnover of motor vehicle transportation in the USSR is only 33 percent of the corresponding figure in the United States.

Although the Kama Truck Plant and the Chita Automotive Assembly Plant have organized the production of motor vehicles with good off-road capability for work in the northern regions of the USSR, we are still not producing off-road vehicles in series production. In the north, however, up to 20 percent of total freight turnover must be hauled without roads. We must set up mass production of trucks that can drive on snow and swampy terrain, all-terrain vehicles, and the like.

Because Siberia is increasingly developing construction and, especially, open-cut mining, the paramount challenge is to improve mining dump trucks to haul hard rock and coal trucks and other vehicles to haul soft rock. Since 1976 our country has produced such dump trucks with a load capacity of 75 tons, and 120-ton vehicles are ready for production, while 180-ton vehicles are coming up. But foreign countries have trucks with load capacities of up to 500 tons and are working on the problem of producing 100-ton dump trucks.

The lack of dump trucks with increased load capacity, especially ones suitable for work under harsh climatic conditions in Siberia, forces us to buy them abroad.

These types of vehicles require increased expenditures for production and therefore, in our opinion, the USSR Ministry of Motor Vehicle Transportation does not have an interest in producing such vehicles because it requires the allocation of additional resources. Its chief interest is in a maximum increase in the total tonnage of trucks, because the efficiency of expenditures for the production of motor vehicles is determined by the volume of transportation work they can do. Therefore, technical progress in the area of motor vehicle building is oriented chiefly to reducing the prime cost of the vehicle and raising its productivity in freight shipping. The USSR Ministry of Motor Vehicle Transportation is responsible for performance of the planned freight turnover. However, this approach is acceptable only for general-use transportation, which does less than one-third of all vehicle shipping. The entire remaining fleet of vehicles is used to serve particular sections of the economy.

An increase in the proportion of general-use transportation could have a decisive influence on reducing expenditures for freight shipment by motor vehicles. In the last 15 years its proportion of total motor vehicle freight turnover has not changed; in 1979 it was 30.1 percent, compared to 38 percent for general-use vehicle transportation in the United States today. The average prime cost for general-use motor vehicle transportation is 31 percent lower than for motor vehicle transportation as a whole, while the productivity is 35 percent higher.

The indicators of the use of vehicles in motor vehicle transportation as a whole are worse than for general-use motor vehicle transportation. Thus, if all motor vehicle transportation in 1975 had achieved the use coefficient of general-purpose motor vehicle transportation, freight turnover would have been 6.4 billion ton-kilometers greater. The average working day of trucks abroad is 15 hours, but in the USSR it is 9.6 hours. Freight turnover could be increased by almost 200 billion ton-kilometers by increasing working time; this is roughly twice the total freight turnover of our country's general-use vehicle transportation.

The indicators of general-use vehicle transportation are better chiefly because of centralization of shipping and consolidation of motor pools. The average general-use motor pool has 120 vehicles, while the average motor pool in specific sectors has 17. The number of motor pools with 10-14 vehicles within the entire system is not decreasing; indeed, between 1971 and 1976 the number of such motor pools increased 1.5 percent. At the same time, motor pools with more than 100 vehicles have labor productivity figures 45-50 percent higher and a prime cost of shipping that is 20-25 percent lower than motor pools with 10-24 vehicles.

No one doubts the high efficiency of general-use motor vehicles. Nonetheless, the share of general-use transportation in the country's vehicle fleet is not increasing, it is decreasing. Moreover, the management of the general-use system is spread out through the particular republics.

It seems that L. I. Brezhnev's instructions, given at the 25th party congress, concerning the formation of intersectorial management bodies is especially relevant here. Only an intersectorial body on the level of the national economy can coordinate the work of the numerous departments who have motor vehicles in a way that will more fully meet the demands of the economy for vehicle shipping. In our opinion, it would be advisable to concentrate all planning for shipping in an intersectorial body. This body would play a special role when the five-year plan has become the chief form of national economic planning.

An intersectorial body could also exercise an influence on the establishment of rates. In many regions of the country the charge for freight shipment by general-use motor vehicles is more than the prime cost of shipping in an enterprise's own vehicles, which gives departments material incentive to ship in their own vehicles.

An important job of the intersectorial management body for the vehicle transportation complex would be to define the optimal structure of vehicles to produce. Vehicles haul hundreds of different types of freight. Most of them require specialized vehicles. This body could be the sole customer of the USSR Ministry of Automotive Industry for production of the necessary types of motor vehicles, just as the Ministry of Railroads is a client of the USSR Ministry of Transportation Machine Building, the USSR Ministry of the Maritime Fleet and the RSFSR Ministry of the River Fleet are clients of the USSR Ministry of Shipbuilding Industry, and so on.

The lack of a single client for the production of motor vehicles leads to a situation where the most commonly produced vehicle is the general-purpose truck of medium load capacity. The USSR Ministry of Automotive Industry today is building up the country's fleet of vehicles by producing vehicles that are capable of serving a maximum number of users. From a departmental standpoint the production and operation of specialized vehicles is more expensive than general-purpose vehicles. The intersectorial body would confirm the national economic benefit of specialized vehicles, because they provide a savings of labor in loading and unloading work. The impact of freeing the persons employed in these jobs appears only at the level of the national economy.

Establishing a body to manage the motor vehicle transportation complex could accelerate scientific research work in the field of vehicle tranportation and bring it into line with its role of supporting national economic shipping. Centralized motor vehicle transportation enterprises of the Glavmosavtotrans [Main Administration of Motor Vehicle Transportation of the Moscow City Executive Committee] type could expand their work under the direction of such a body.

We think that the intersectorial body would manage road construction and development of the road system. Only 10-15 percent of road construction, repair, and operation is financed from centralized sources today. The capital is often not used for its designated purpose and a large share of the work is done by kolkhozes and industrial enterprises who do not have appropriate construction machinery or the necessary experience. A body that managed the motor vehicle transportation complex would concentrate all financial resources designated for the road system and act as the sole client of the USSR Ministry of Transportation Construction, which is the general contractor in construction of the country's primary roads.

Our country is significantly short of the paved roads required for efficient economic development.

It must be understood that this backwardness is a legacy of our historical development. The terrible road system of Tsarist Russia is common knowledge. The special character of our pattern of territorial settlement, which left vast regions of Siberia unpopulated for centuries, is also common knowledge. Nonetheless, with the transition to the phase of developed socialism today, we cannot use the excuse of bad roads in the past. We must orient ourselves to the countries with highly developed infrastructures. The USSR is far behind them. We have just one-seventh of the paved roads per unit of territory of our neighbor Finland, and just one-tenth of the figure for the United States. The Engel coefficient, a comprehensive coefficient of the availability of roads that also considers population size, is the same for the USSR and India, and this is a very low figure.

Even in this situation our country continues to invest significantly less capital in road construction than the developed capitalist countries do. Thus, in the USSR these expenditures do not exceed 0.8 percent of national income, whereas in the United States they are 3.3 percent, in West Germany 3.7 percent, in Japan 3.8 percent, and in Canada 5.1 percent.*

Calculations by many investigators show that national economic losses owing to lack of roads under current conditions are 2-3 times greater than the expenditures of our countries for development of the road system.

Roads have great social importance. Under contemporary conditions it is intolerable for populated points with administrative and cultural centers not to have reliable year-round transportation links. This is possible only if there are paved roads. But most rural inhabitants of the country today use unpaved roads. Many paved roads are not conducive to traffic safety: there are too few multilevel intersections, traffic instructions, and the like.

The decree of the CPSU Central Committee and USSR Council of Ministers adopted in 1980 under the title "Steps To Improve the Construction, Repair, and Maintenance of Vehicle Roads in the Country" laid out major steps to overcome our country's backwardness in roads. The work to be done in Siberia is particularly important.

Siberia is far behind in development of its road system. Although the development of main communications routes in Siberia has gone forward in recent decades at a faster pace than the USSR average, which is appropriate to the challenge of accelerated development of the productive forces of Siberia, the pace of road construction is plainly unsatisfactory. Statistics show that the growth in length of paved roads in Siberia between 1960 and 1970 was less than growth for the country as a whole.

Road construction picked up somewhat in Siberia in the Ninth Five-Year Plan and proceeded at a rate greater than the USSR average. Between 1965 and 1975 the length of paved roads in the country as a whole increased 1.74 times, whereas in Western Siberia it increased 2.2 times and in Eastern Siberia 1.9 times.

Although the rate of road construction in Siberia in recent years has risen, there is still a clear shortage of such roads. Each year 2,000-2,500 km of paved roads are added in Siberia, while the total length of unpaved roads is at least 130,000-140,000 kilometers. Siberia today has just 8.8 percent of the country's paved roads; in 1960 its proportion was 6.3 percent.

Compared to paved roads, unpaved roads reduce vehicle speed by one-half to two-thirds, while relative expenditures for fuel and tires per ton-kilometer increase 1.5-2 times and the vehicle mileage between overhauls is cut to one-half or less. The prime cost of shipping increases almost 2-5 times.

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* Afanas'yev, L. I. (editor), "Povysheniye Effektivnosti i Kachestva Raboty Avtomobil'nogo Transporta" [Improving the Efficiency and Quality of Work by Motor Vehicle Transportation], Moscow, "Transport", 1977, pp 192, 201.

These indicators are figured for unpaved roads in good condition during dry weather. When the roads are in poor condition and during rainy weather traffic speed drops to 10 kilometers an hour, accidents and downtime increase, and expenditures for fuel and tire wear increase roughly 2-3 times compared to the figures for unpaved roads in good condition. The prime cost of shipping reaches 30 kopecks per ton-kilometer instead of 5-12 kopecks and the mileage between overhauls drops from 90,000-50,000 kilometers to 20,000-10,000.

Roads have a decisive impact on the economic indicators of freight shipping by motor vehicle transportation. Thus, the Estonian SSR has the greatest density of motor vehicle roads in the country and the lowest prime cost of vehicle shipping. For comparison, let us point out that the prime cost is 25 percent higher in the republics of Central Asia, which have good climatic conditions but only one-quarter as many roads. In regions where lack of roads and harsh climate combine (Siberia and the Far East) the prime cost is 2.2 times higher. This inequality in road systems makes it more difficult to meet the challenge set by the party of preferential development of the eastern regions.

An intersectorial body to manage the motor vehicle transportation complex would direct the development and implementation of a uniform program to build up this major sphere of the economy, and this is ultimately the most important condition for raising the efficiency of motor vehicle transportation.

In conclusion I would like to observe that the motor vehicle transportation complex has an important part in solving the transportation problem in the country as a whole, and especially in Siberia. It requires the appropriation of enormous resources and management of these resources is complicated by interdepartmental barriers. A consideration of the special characteristics of the motor vehicle transportation complex that have been discussed above will help determine the most efficient ways to develop the complex.

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MOTOR VEHICLE

BRIEFS

NORTHERN CONSTRUCTION COST—The cost of construction in remote northern regions of Siberia is 2-3 and more times higher than in the European part. Road construction in the northern regions of the Western Siberian plain is 5-6 times more expensive than in the central zone of the RSFSR. Railroad construction requires an average of 450,000-500,000 rubles per kilometer, rising to as much as 1.4 million rubles per kilometer in some places. The construction of gas pipelines under conditions of the Western Siberian plain is 1.5-2 times more expensive than in the European regions. [Text] [Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 4, 1981 p 74] 11176

LARGE SCALE DUMP TRUCK--Alma-Ata--Members of the Institute of Mining of the Kazakhstan Academy of Sciences have constructed a largescale (bol'shegruznyy) dump truck. Its experimental model is successfully being tested in Tul'skaya oblast in the Novomoskovskiy Gypsum Combine, carries 20 tons of freight per trip. Instead of a diesel motor in the dump truck, caustic storage cells and automatic control system, and a direct current motor have been set up. [Moscow SEL'SKAYA ZHIZN' in Russian 15 Feb 81 p 1]

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BAM PLANS, PROGRESS IN BURYATIYA

Moscow AGITATOR in Russian No 3, Feb 81 pp 18-20

[Article by V. Biryukov, secretary of the Buryat Obkom of the CPSU: "Buryatiya: A Zone of the BAM [Baykal-Amur Main Line"]

> [Excerpts] To inaugurate movement of trains over the entire length of the Baykal-Amur Railroad Main Line.
>
> From the CPSU Central
> Committee plan as presented
> at the 26th Party Congress

Every year sees growth in the volumes of construction and installation work in the Buryat sector of the Baykal-Amur Main Line. The railroad there traverses areas of severe and unequalled natural beauty--the northern shore of the Baykal, the Upper Angara, and the virgin taiga with its swift rivers and crystal-clear streams. But it is not just its unique beauty that is characteristic of this sector. It is also notable for its complexity.

Along its length of 524 kilometers it is necessary to cut through 27 kilometers of tunnels, to build 475 small, 95 medium-sized and 14 large bridges, to remove 84 cubic meters of soil from under the railroad bed, and to build the city of Severobaykal'sk, nine railroad stations, 22 sidings, a large number of dwelling houses, and industrial, railroad, electric power, cultural and personal service, and municipal installations.

Every kilometer of the railroad track in the Buryat sector is far more costly than in the other sectors. It goes through wholly uninhabited taiga areas. The snow cover on the mountain passes reaches 3-3.5 meters. The winter temperature goes to minus 57-59 degrees. There are difficult geological and hydrological conditions: permafrost, ice, and thermal waters.

From the very beginning of the construction the oblast party committee maintained constant control over the progress of the construction of the line. At the meetings of the CPSU obkom bureaus, the commission for BAM construction, and among the party administrative aktiv they reviewed the problems entailed in expediting construction of a railroad line in the Severobay'sk-Angoya sector, organizing competition among the drift mining brigades of the BAMtonnel'stroy [BAM Tunnel Construction Trust], protecting the environment, and constructing water reservoirs and other installations.

The chief result is the establishment and assembling in the northern part of the republic of the capacities of more than 50 construction and production collectives. Included are construction and installation trains, tunnel detachments, mechanized columns, bridge detachments, and other subdivisions. At work in them are envoys from Moscow and Leningrad, the Ukraine, Belorussia, Moldavia, Estonia and Lithuania, and a large detachment of workers and specialists from our republic.

A good deal has recently been accomplished by the international collective of many thousand members. In October, 1979, the first train arrived at the northern Baykal area--operational traffic had been opened as far as the main base of the construction workers--Severobaykal'sk. In December of the same year we completed construction of a 300-kilometer electric power line to the Severo-Muysk tunnel and began supplying regular power from the Ust-Ilimsk GES to the tunnel builders and to the settlements of Kichera and Uoyan. On the eve of the 110th anniversary of Lenin's birth we completed the first small tunnel connection in the Baykal pass.

In June, 1980, the first passenger train arrived at the center of Severobaykal'skiy Rayon--Nizhneangarsk. Every month the railroad workers of the temporary operational section haul 80,000 tons of national economic freight for the construction workers in our sector.

At work in Buryatia are the envoys of the 17th Komsomol Congress and working as an organized united collective is the detachment imeni 18 S"yezda VLKSM--it has been tasked with constructing a 100-kilometer sector of the railroad line: from the 360th to the 460th kilometer.

Last year the collective of the construction project was reinforced by a Young Guard detachment. It is made up of representatives from the Ukraine, Moldavia and Buryatia. The detachment has been assigned the task of erecting permanent structures in Severubaykal'sk. In July, 1980, a detachment of 120 persons--the "Buryat Komsomol Member"--got off at the most distant station of our sector--Taksimo--and began work.

New Multistoried Homes in Severobaykal'sk
(the Buryat Sector of the BAM)

In 1980 the construction workers of the Buryat sector put into operation nearly one-half of the capital investments allocated for construction of the entire BAM line. Thousands of workers, engineers and technicians are setting outstanding examples of dedicated labor. Well known throughout the construction project are the names of these laureates of the Lenin Komsomol Prize: track-laying brigade leader Aleksandr Bondar', carpenter brigade leader Valeriy Prokushev, lumberjack brigade leader Aleksandr Ryabkov, tunneler brigade leaders Valentin Tolstolikhov, Vladimir Smirnov, Yuriy Bordachenko and Leonid Bazaliy, and RSFSR Supreme Soviet deputy Ivan Samaylov.

Now, when the construction has been developed on the entire length of the Buryat sector of the BAM (in 1981 the railroad in the territory of the republic will be operated for a distance of 200 kilometers), it is essential to expedite the construction of locomotive depots and railroad stations. However, the planners are dragging their feet. There is no complete documentation for the construction of the settlements of Nizhneangarsk, Kichera, Angoya and others.

More and more attention is being focused on the preparation for the economic development of the BAM zone. The basic orientation of the geological survey work has been for the establishment of a mineral and raw material base for the lead and zinc industry and the construction industry; also providing a water supply for the stations. Alongside the route is a very rich deposit of chrysotile asbestos. But, unfortunately, the Ministry of the Building Materials Industry is slow in developing it.

A goodly number of problems has arisen in respect to electric power supply for the installations of the western sector of the line. These problems will for the most part be resolved through the construction of the Mokskiy GES on the Vitim River, virtually alongside the railroad route. The power from this GES could further the development of the Severo-Baykal'sk, Bodaybinskiy and Udokanskiy industrial centers. In addition, the GES would enable us to provide for regulation of the Vitim discharge, a matter of great importance for the industrial and agricultural development of the Muya-Charsk hollow and the turnover of scores of thousands of hectares of land.

In our sector of the BAM the land of the Burguzin and Muya hollows must become the chief base for the supplying of food products. The figures show that if a land improvement system is set up here, it would be possible by 1990 to fully satisfy the population's needs for milk and milk products, potatoes, and vegetables.

The Buryat sector of the BAM is rich in various types of mineral resources. Near the resources of Davshanskiy, Khakusy and Verkhnyaya Zaimka on the Baykal shore the Nizhneangarsktransstroy [Lower Angarsk Transport Construction Trust] is setting up a rest base. When the line reaches the Baykal, there will be a considerable increase in the flow of Soviet and foreign tourists. Consequently, the main administration for health resorts in the AUCCTU and the Central Council for Tourism must study the possibility of establishing here a network of rest homes, dispensaries, resort hotels and motels.

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FINNISH PRESS: FINLAND-USSR ELECTRIC LOCOMOTIVE PROJECT

Helsinki HUFVUDSTADSBLADET in Swedish 7 Apr 81 p 12

[Text] The Soviet commercial organization V/O Energomashexport and Oy Stromberg AB have signed an agreement to cooperate on the production of frequency converters for electric locomotives. The agreement was signed in Moscow by director general V. P. Pavlov of Energomashexport and director Antti Potila of Oy Stromberg AB.

This agreement is directed toward the joint utilization of the frequency converter technology developed by Stromberg to be used in electric locomotives produced in the Soviet Union. With the help of the frequency converter technology, the properties of the electric locomotive will be utilized more advantageously than previously and the need for maintenance will decrease considerably.

The agreement which has now been signed also provides for the marketing of jointly produced electric locomotives in third countries.

Test Locomotive

To begin with a test locomotive with 12 axles and extremely high power will be produced. It is formed by two connected locomotive sections with six axles each. The total power is about 11,000 kW (15,000 hp). The locomotive is being produced to meet the specifications of the Soviet Traffic Ministry and it will be complete in 1985. Subsequently, there will be a trial run program lasting about 1 year, which will take place under severe climatic conditions, including the Baikal-Amur route in the Soviet Union.

If the test locomotive meets the specifications of the Soviet Traffic Ministry, the present agreement states that Stromberg will deliver its share of the electrical equipment to the Soviet Union for at least 65 locomotive sections with 6 axles.

Stromberg and the Soviet electric locomotive industry have long cooperated in the production of Sr-1 electric locomotives for Finland's national railway. Ninety of these have already been delivered and the total number will reach 100. However, the frequency conversion technology, which was developed later, was not utilized in these.

It is possible to get some idea of the power of the electric locomotive that will now be built for the Soviet railway by comparing it to the Sr-1 electric locomotive now being delivered to Finland. The power of 11,000 kW and weight of the former are 3.5 times greater than that of the Sr-1.

Offer To Denmark

Cooperation in third-country markets has already begun, since Energomashexport and Stromberg have offered the frequency converter electric locomotive to Denmark's State Railway.

The frequency converter technology developed by Stromberg has been used previously in many lighter electric powered vehicles, such as subway trains, streetcars, and trolley buses both in Finland and abroad. Frequency conversion is also used extensively in industry.

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GEORGIAN SSR DEVELOPS CONTINUOUS, COORDINATED PLANNING FOR TRANSPORTATION

Moscow VODNYY TRANSPORT in Russian 25 Apr 81 p 2

[Article by V. Lavruk and Yu. Lukasik, special correspondents: "A Variation of Coordination — from Centers to a Region"]

> [Excerpts] Building on the method of the allied workers in Leningrad, the seamen of the Georgian Steamship Line and the railroad and motor vehicle workers of the republic are working vigorously to develop a continuous schedule of work for the regional transportation system.

Georgian port workers, seamen, and railroad and motor vehicle workers have done a great deal toward successful introduction of continuous schedule-plans for the work of transportation centers (NPGRTU's). First they studied the working experience of the collectives of the transportation enterprises that belong to the Leningrad center, wrote up a temporary statute on organization of the work of the Batumi and Poti centers under conditions of mutually coordinated continuous planning, and issued orders to the managers of the enterprises included in these centers.

In Batumi, for example, a coordinating group for the center was ratified by a joint order of the chiefs of the Georgian Maritime Steamship line and the Transcaucasion Railroad and the general director of the Adzhar Motor Vehicle Transportation Production Association. At their regular meetings twice a month the members of the group discuss questions of improving the work of the allied transportation enterprises and monitor the processing of ships, railroad cars, and motor vehicles. They also resolve problems of providing railroad rolling stock for important import cargoes, discuss ways to improve the quality and comprehensiveness of information on the approach of ships and railroad cars, and analyze the results of the work of the allied workers, in particular the results of processing means of transportation, transshipping cargo directly, and so on.

In 1980 the maritime steamship line began production use of the automated system to control the work of the port of Batumi based on a continuous schedule-plan (NPGRP). The system uses a YeS-1022 computer. The software for this program unit was developed at the information-computing center of the Leningrad commercial seaport. The computer calculates the schedules of cargo-handling work for the upcoming 10-day period and the port services use the schedules as working documents. Operational reports on the approach of ships, daily volume of direct transshipment and transshipment through warehouses, expected approach of railroad cars, and the like are used as raw data.

Experimental operation of the automated system for management of the port of Poti based on a continuous schedule-plan was begun this year. Work procedures are practically the same as at the port of Batumi. T-63 teletypes are used to transmit raw data and schedules obtained as the result of calculations.

Automatic management of the schedule makes it possible to free main port dispatchers from the mechanical work of making multiple calculations of the use of the mechanized lines by cargo-handling areas. Use of specially developed software to compile the design of the automated system made it possible to increase the operational depth of continuous planning in the port to 30-40 days and more. The schedule includes all ships that have given notice of an expected time of arrival in port. Thus, the shipowner has an additional opportunity to learn of upcoming accumulations of ships in the port and take steps to prevent ships arriving in bunches. This will help reduce unproductive downtime.

After the transition to automated management of the continuous schedule-plan for the port was completed, an automated system to manage the continuous plan-schedule of work of the transportation center was introduced. This also produced notable results.

In Batumi, for example, both collectives (port and railroad workers) successfully completed the assignments of the 10th Five-Year Plan. Based on work results in 1980 the Batumi commercial seaport and the Batumi railroad freight station were awarded Certificates of Honor of the Ministry of the Maritime Fleet, Ministry of Railroads, RSFSR Ministry of the River Fleet, RSFSR Ministry of Motor Vehicle Transportation, and the central committees of the sectorial trade unions.

The first quarter of 1981 ended with good results too. The collective of the railroad station fulfilled its plan for shipping import freight by 112 percent, the assignment for static load by 110 percent, and the assignment for direct transshipment of freight by 132 percent. The port workers fulfilled their quarterly plan for transshipment of cargo by 125.3 percent, increased labor productivity in loading-unloading work by 23.2 percent in comparison with the plan, cut the time required to process one railroad car by 0.7 hours, and saved 1,662 ship-hours of time spent at anchor.

It is important to emphasize that the transportation workers of the Batumi center achieved this under existing conditions, without any capital investment, simply by improving the coordination of work among allied workers and introducing integrated continuous planning.

It has now become clear, however, that a number of problems must be solved to continue the progress.

Issues Raised by Experience

Soon after introduction of the automated control system for port work on a continuous schedule plan and continuous schedule-plan for the work of the transportation centers, it was found that there was no significant improvement compared to the previous manual system. This was not accidental. The fact is that the Batumi and Poti railroad stations belonging to the corresponding transportation centers are not capable, on their own, of supplying the ports with the railroad cars necessary to ship import cargo. This happens for several reasons.

In the second place, there must be coordinated, balanced development of the sectors and a build-up of their capacities. Otherwise, the large capabilities of one sector will be nullified by the inadequate resources of the other. This happened in both Batumi and Poti, where the ports, especially in recent years, have developed vigorously while the railroad stations have not. The carrying capacities of the docks and stations are now quite different. As a result of this disproportion, state transportation costs are growing.

This example shows very well how the development of all the subdivisions working within a single transportation center demands precise coordination. The time has come to approach these problems in the same way as we approach the development of territorial production complexe .

All of these problems which are holding back continued growth of the carrying capacities of the Batumi center are awaiting solution. The workers in the Poti transportation center face similar questions, and they too must be answered.

The situation which has now developed in the ports also illustrates the necessity of solving the problems quickly. We are referring to handling foodstuffs, in particular grain products. The flow of these cargoes is quite significant. It must be admitted that the port workers proved better prepared to handle them than the railroad workers. At the present time the railroad workers cannot meet the requests for cars and frequently fail to deliver rolling stock as planned. Examples are not hard to find.

Thus, whereas an average of 94 railroad cars a day were loaded with grain in both ports in the first 11 months of 1980, and 123 cars a day were loaded in December, after the intervention and aid of higher-ranking bodies the figure reached 182 in January 1981. Analysis indicates that this is not the maximum either. The railroad workers could provide even more rolling stock if they had, as the saying goes, the will and the skill. For their part, the port workers can load 260 cars a day with grain given good conditions. Incidentally, they have confirmed this in practice more than once.

How can the problem be solved? Without discussing the matters considered above, we should emphasize that the Leningrad method, used with due regard for all local conditions, is expected to play an enormous part.

But we cannot overlook the fact that the potential of the Leningrad method, which has been approved by the CPSU Central Committee, is not being used fully at all in either port. They have yet to develop uniform technological processes for the work of the railroad stations and ports of Batumi and Poti, to conduct daily analysis of management of the continuous schedule-plan for the work of the transportation centers, and solve other similar problems which have already been taken care of at other transportation centers.

It seems to us that the main reason for this situation is that information support from the railroad workers for mutually coordinated continuous planning is still in the embryonic stage. But this reliable information is precisely what makes possible a sharp improvement in the efficiency of the entire transportation system.

The Transcaucasian Railroad does not now have debugged software. Therefore, its computer center does not have a dynamic model of the status of the trains and cannot give even an approximation of the time when a certain load will arrive at a certain point. As a result, reliable information on the delivery of railroad cars usually arrives less than 24 hours before the arrival of the cars. Often the notification is just a few hours ahead of the cars, and sometimes the cars arrive first. With this kind of information support, obviously, the return from introduction and elaboration of the Leningrad method will be much less than it could be.

Motor Vehicle Workers Will Become Partners

About 100,000 tons of the total volume and structure of freight handled in the Batumi and Poti centers each year is freight in bags and containers that is shipped by railroad to the various regions of Georgia, Armenia, and Azerbaijan. If motor vehicles were to take over just this shipping, it would release some 2,000 boxcars, which are in great demand. In addition, the ports would be able to handle more import cargo.

When we recall the capabilities of the motor vehicle workers, we must emphasize that we are not speaking of their cooperation with port workers only. Specifically, improving the coordination of the work of motor vehicle and railroad workers would have an enormous impact on achieving the final result of all the allied workers — rapid movement of freight would free a large number of railroad cars, which is enormously important for the national economy in general and for the maritime fleet in particular.

At present, of course, the motor vehicle workers experience the problems in relations with the railroad that the port workers do: inadequate advance information on the arrival of freight, usually less than 24 hours notice. This makes it difficult to organize direct transshipment of freight from railroad cars to motor vehicles, which makes it impossible to reduce the volume of loading-unloading work and vehicle downtime. On the other hand, it is proving very difficult in practice to notify recipients of the time of arrival of freight so that they can prepare to receive it. In the end, vehicle downtime for processing is not being reduced here either.

Shipment in small batches, the great diversity of freight on trains, and inadequate use of stacking and containerization also make cooperation between motor vehicles and the railroad more difficult. These things complicate the mechanization of loading operations and increase downtime for processing for both railroad cars and motor vehicles.

On the Scale of the Entire Republic

The different transportation centers have found and are finding different solutions to the problems that face allied workers. In certain transportation centers which are remote from railroad sections and administrations, port and railroad station workers try to include the sections in the sphere of cooperative work and set up precise communications with road administrations.

Employees of the Georgian Steamship Line working with the Georgian SSR State Committee for Science and Technology have come to the conclusion that many problems can be solved by broadening the framework of mutually coordinated planning to the level of a continuous schedule-plan for the work of the regional transportation system. In this case the scale of planning is no longer the transportation center, it is the entire republic. The system will include the Batumi and Poti transportation centers, the Transcaucasian Railroad, and the motor vehicle enterprises.

The advocates of introduction of a republic-wide system began from the fact that the allied transportation organizations have adequate capacities to keep the Batumi and Poti ports working at maximum carrying capacity. Moreover, they believe that because of special features of the structure of the regional transportation system in Georgia it is even simpler to organize close cooperation among allied workers than in the Leningrad center.

Needless to say, this system must go through several stages in its development. In the first stage it seems advisable to test the planning concepts proposed by the developers of the automated control system for the Leningrad transportation center under Transcaucasian conditions. It is important to emphasize that the software of this system was tested at the information-computing center of the Georgian Steamship Line last year.

In the very near future, and still just in the first stage (later they intend to go further) the railroad workers are planning to organize information support for the automated control systems for continuous schedule-planning of transportation centers and regional work as follows. Because of significant deviations in the time that trains pass checkpoints, information is divided into preliminary and refined information. The preliminary data will be sent from junctions, make-up stations, and checkpoints of the Samtredia section of the road to its infromation center, which will transmit it on to the Batumi and Poti centers 24-36 hours before the arrival of the trains there. The port workers will also receive refined information from the information center of the section, 6-8 hours ahead. Then the information-computing center of the Georgian Steamship Line, using its Akkord-1200 equipment, will transmit a schedule-plan made up taking this information into account to the computing center of the Transcaucasian Railroad, which will duplicate it, correct it, identify cars with export freight, and again transmit it to the information-computing center of the steamship line. But now it will be a working document.

Solving all these organizational and technical problems will make it possible to provide all participants in the transportation process — the dispatchers of the ports, railroad stations, steamship line, railroad sections and administration, and Ministry of Motor Vehicle Transportation — with timely, reliable, periodically updated information on the movement of freight flows and volume of transshipment and the necessary equipment for all forms of transportation.

In other words, conditions will be created for improving the quality of management of the transportation process by providing all management bodies with full and reliable information.

Thus, the transportation workers of Georgia have taken another step forward toward development of a system of continuous, mutually coordinated planning and bolstering the coordination of maritime, railroad, and motor vehicle transportation. The continuous schedule-plan for the work of the regional transportation system (NPGRRTS) will operate as a functional part of the republic Gruziya automated control system. Broadening coordination from the level of transportation centers to a regional system will make it possible to lower transportation costs significantly, speed up the movement of freight, greatly improve the regularity of the transportation system, meet republic and national shipping needs more completely, and successfully fulfill the plans and assignments of the 11th Five-Year Plan.

11,176
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COORDINATING AUTOMATION IN DESIGN AND PRODUCTION STAGES

Leningrad SUDOSTROYENIYE in Russian No 2, Feb 81 pp 35-36

[Article by L. D Voytasik and N. M. Pinevskiy: "The Comprehensive Approach to Automating the Processes of Design and Production"]

[Text] The appearance of automated design systems raised new methodological problems for both hardware developers and production technological services. The lack of a uniform methodological approach when the processes of design and production interact reduces the efficiency of the "design-production" system.

In this article the authors attempt to show the fundamental features of the interrelationships of these processes and the necessity of a comprehensive or integrated approach to automating them within the "design-production" system. The example used is building functional units of digital equipment for information-computing systems.

This class of equipment is organized by the functional-design principle on the basis of a hierarchy of design units (assemblies). The "design unit" is the functional unit. The labor-intensiveness of making functional units is 45-55 percent of total labor input for production of the equipment. This equipment typically has highly regular design, but comparatively low regularity of functional structure because the requirements of work on a real time scale generally compel the use of rigidly fixed data processing algorithms. As a result, there are some 300 types of functional units in production with a range of applicability, and therefore also production, of 40 percent. Design-technological analysis indicates that only one of the seven standard functional units can be considered to meet technological requirements, and it is just two percent of annual production. Ninety-two percent of the standard functional units can in principle be manufactured in an automated technological process on the condition that various nontechnological operations are eliminated; eight percent of the units are not suitable for manufacture in such a process. The labor-intensiveness of making a technological unit is roughly one-third of the figure a nontechnological unit. In this case the term "technological" means that it is possible to manufacture the unit in a linear technological process where the units move in one direction without uncalled-for transfers, making maximum use of automated equipment (both equipment now in use and equipment planned for introduction). Of course, irregularity of functional structure is not the only reason for low labor productivity.

In view of the fact that labor-intensiveness is the principle criterion for evaluating the production process, we will analyze the factors that affect labor-intensiveness, dividing them into design and production factors.

The chief design factor that increases the labor-intensiveness of articles is design inaccuracy from the standpoint of considering the technological requirements of manufacturing and debugging the unit. Equipment designers, striving to meet tactical-technical specifications and achieve innovative solutions, devote little attention to fitting with a particular technology. But, as can be seen from the discussion above, this is the basic requirement of the production process.

The chief production factor in high labor-intensiveness is an inadequate level of automation of production processes.

The introduction of automated technical equipment in production reduces the labor-intensiveness of manufacturing output dozens of times, sometimes hundreds of times. But at the same time, it leads to a sharp increase in time required for technological preparation for production and demands an expansion of "supporting documentation" (with a decrease in the total volume of technical documentation), an improvement in the quality of technical documentation, and a rise in the qualifications of production personnel. These difficulties can be overcome only if a uniform technical policy is followed within the "design-automated production" system so that design results are used directly in the "production" process without intermediate "technological preparation and debugging." With this approach, technological documentation should be prepared as a part of the process of preparing technical diagrams, debugging documents, and operating documents. In other words, it should be an integrated part of the design process. What are the possibilities during design work for improving technological suitability and reducing the labor-intensiveness of the production process?

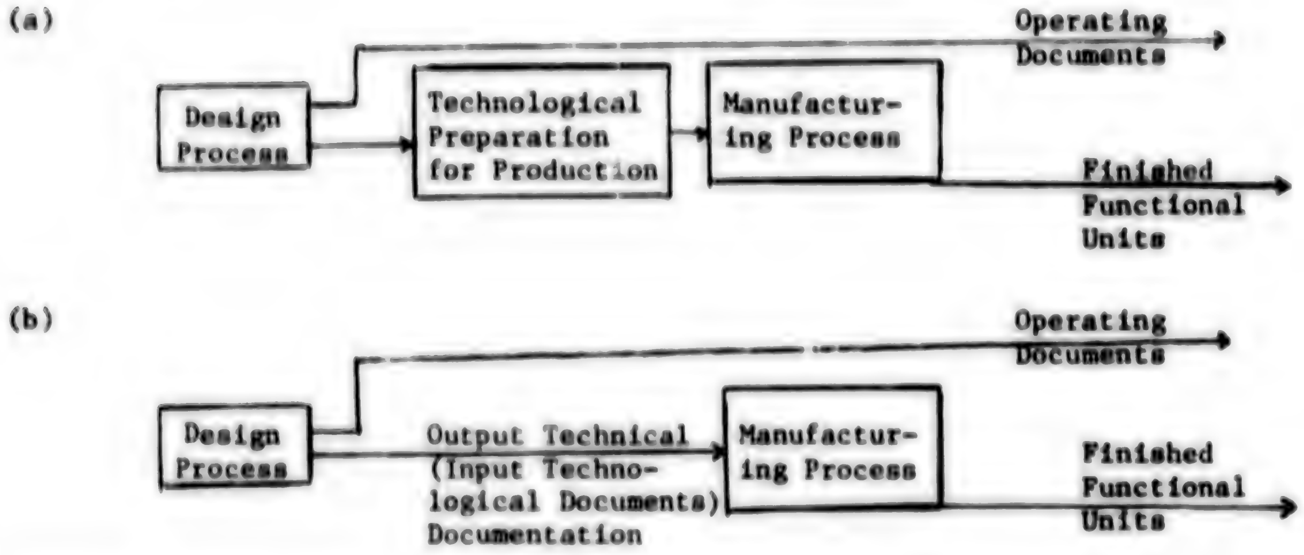
The most efficient way to organize effective communication in the "design-production" system is to automate design work and technological preparation for production within an automated design system which makes it possible to obtain high-quality documents that take account of the requirements of technology and standardization (including standardization on machine media) and are designed for automated equipment. This greatly simplifies the process of putting the document into production and promotes the introduction of automated means in technological processes. This process can be called "comprehensive" in the "design-production" system.

At the same time, this approach requires the preparation of appropriate methodological support to enable technologists and designers not only to speak the same language but also to use the same criteria to evaluate the equipment.

The basic criterion of the efficiency of a comprehensive process should be the criterion of minimum expenditures to organize the production of equipment after completion of the design process and the transition to the production cycle.

Automated design systems oriented to concrete types of production are the basis for meeting this criterion. In certain cases, however, the developers of

Figure. Structure of the "Design-Manufacture" Process for Functional Units with (a) the Manual Method, and (b) the Full Automation Method


(a)
Operating Documents
Design Process
Technological Preparation for Production
Manufacturing Process
Finished Functional Units
(b)
Operating Documents
Design Process
Output Technical (Input Technological Documents) Documentation
Manufacturing Process
Finished Functional Units

automated design systems use the system only to reduce the labor-intensiveness of the design process; they do not "match" the automated system to the technological processes and equipment existing at the particular enterprise and do not take part in making orders for future technological equipment at "their" enterprise. The plans for introduction of automated design systems and plans for the automation of technological process and incorporation of "new technology" are not mutually coordinated at some enterprises. As a result, designers are not able to use automated design methods in the particular subject area.

Analysis shows that when automated methods are introduced without considering the specific technological features of production the process of incorporation drags out for 3-5 years.

The introduction of a comprehensive "design-production" system makes it possible; to reduce the time required for technological preparation for production; to standardize technological processes and equipment for debugging and maintaining automated production; to reduce the flow of change notices; to reduce the time of the "design-production" cycle.

The figure (above) shows the structure of interaction of the "design-production" processes for functional units of the class of equipment under consideration.

Analysis of the possibilities for introducing comprehensive automation in the production of this class of equipment demonstrated that the labor-intensiveness of the "design-production" cycle can be reduced by two-thirds, that 70 percent of the technological operations can be automated, and that a sharp decrease is possible in the amount of time between receiving the technical specifications and producing the first series-produced functional unit. This confirms the high efficiency of the proposed concept.

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11,176
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OCEAN AND RIVER

OMSK PORT WORKERS FACE SUPPLY PROBLEMS FOR SHIP REPAIR WORK

Moscow VODNYY TRANSPORT in Russian 26 Mar 81 p 2

[Article by V. Rogozin, member of the people's control group at the port of Omsk: "A Strict Accounting — Looking at Ship Repair Work"]

[Excerpts] The port workers of Omsk face important challenges in the 11th Five-Year Plan. The crews of ships and cranes and brigades of port workers must do a great deal to insure timely, good-quality delivery of cargo, provide better service for passengers, improve the economic indicators of their labor, and insure ship safety.

The efficiency of this important work will depend largely on how completely and well the fleet, cranes, and port equipment are repaired. Therefore, port patrols have been keeping a special eye on this aspect of production work here since the beginning of the winter ship repair period.

Ship repair on the Irtysh has entered its concluding stage, so the plans of the people's controllers for the immediate future include checking on performance of the schedule for turning ships and equipment over in technical and operating readiness and accomplishments with respect to conserving metal, raw materials, and electricity. When the shipping season begins the next problems will be insuring preservation of cargoes, reducing ship and railroad car downtime for processing, and increasing the carrying capacity of the fleet.

The Omsk river workers are planning to open the shipping season earlier than usual this year. Therefore, it is especially important to make timely and good-quality preparations. If current ship repair depended entirely on correct and precise organization of the labor of the port workers, the collective could already give a guarantee that it would be completed on time. However, the quality and time of repair work often depends greatly on external circumstances, for example dealings with suppliers. People's controllers are very alarmed by the lack of spare parts of 6413/22 engines for design 911 ships. The crews today are forced to get along without them, using all kinds of refinements and adaptations.

11,176
CSO: 1829/257

OCEAN AND RIVER

PROBLEMS WITH CARGO HANDLING AT ARCTIC PORTS

Moscow VODNYY TRANSPORT in Russian 28 Mar 81 p 2

[Article by V. Speranskiy: "Breaks in the Chain"]

[Excerpts] It is common knowledge that many of the workers at Arctic ports are seasonal. This is natural because many fewer workers are needed in the wintertime. The Zelenyy Mys seaport has no shortage of permanent work force; each year the port management receives dozens of requests from persons wishing to make long-term labor agreements. Many of them have become fond of the Far North, especially because attractive high-rise buildings and paved roads are appearing in the community and everything is being constructed with an eye to the future. With considerable storage facilities and its own motor vehicle pool, the port is able to employ various workers, whose primary activities are planned for the time after the shipping season, to unload ships. Therefore, Zelenyy Mys is less dependent on seasonal workers than other seaports. Nonetheless, there was a shortage of workers in the 1980 shipping season. They needed at least 50 more persons. All of the dock worker brigades were understaffed, and one was not formed at all.

More than 500 requests to conclude work contracts for the shipping season were received. The port issued calls to only 180. It is difficult to learn why, with such careful selection, some of them did not come. But we can say why many of those who worked in Zelenyy Mys in the 1980 shipping season will not return.

All these things spoiled attitudes and had a negative effect on the moral and psychological climate in the collective. They diminished the labor activism of dock workers. Like new recruits in the military, many of them crossed off each day on the calendar as it passed.

Could it be that the personnel department of the Zelenyy Mys seaport was unable to understand the personal affairs of the persons who submitted requests and invited people who were afraid of northern conditions or of port work in general? No, this was not the case. Newcomers who worked in different specializations at home could possibly become permanent assistants in Zelenyy Mys. They simply have nothing to compare it to. But experienced dock workers from Nikolayev, Il'ichevsk, and Klaypeda who have been in almost all the Arctic ports do not come here anymore. They know that living conditions for dock workers are better in Tiksi, Pevek, and Dikson, communities which are comparable in size to Zelenyy Mys. Unfortunately, the solutions to these problems did not depend on the Zelenyy Mys port.

It is easier, of course, to load a ship than to unload it. This problem is even worse on the Kolyma because the loading ports have modern mechanisms with which they pack every corner of the tweendeck space, but the Zelenyy Mys workers do not have such equipment. There were even problems hoisting goods packed in boxes. It would seem perfectly simple: fasten the hooks, give the hoisting signal, and move on to the next box. But in fact, to find this next box it was necessary to roll over dozens of other boxes, or even more.

Here is one more example. At first large batches of foodstuffs arrived at the port of Zelenyy Mys in containers. This made it possible to free a large number of loading workers; machinery did their job for them. But the time saved was lost because the transshipping base had no equipment to handle such large-sized cargo.

The problem was aggravated in processing bulk cargo arriving in sacks: flour, sugar, mixed feeds, and cement. In 1979 most of this type of cargo came in bundles or on pallets, but in 1980 the loading technology was changed. Bags were used again, as before, laid out on the decking. Instead of two workers, unloading took five or six who worked in the hold, putting the bags on pallets. The port had not expected the cargo to arrive in this form. Soon they ran short of pallets, and at the warehouses instead of placing one pallet on top of the other they had to give them up. The high cost of this "work" generated ridicule, not enthusiasm. And there were complaints about those who loaded the ships: they would not pack them in if just once, under conditions where rain and snow alternate, they had to pick them up and throw them.

We had an opportunity to relate this experience to dock workers in the Far East. It turned out that they have the same problems, and the shortage of work force is becoming more acute because bags are loaded manually. The dock workers talk about this at their meetings and write letters about it to higher-ranking bodies.

In the Department of coastwise shipping at the Dal'flot [Far Eastern Fleet] GKhO [possible State Shipping Association] we were shown several photographs. Some of them showed bags of cement neatly held by belts and stacked; others showed dock workers tossing bags while standing almost waist-deep in cement. In this sense, the Zelenyy Mys seaport is one of the last transshipment bases in the worst condition.

Ideally, cement from torn bags should be repacked. This is probably done somewhere in the south. But there is no such possibility in the ports of the Arctic and the Far East. Now let us make some calculations. We can testify that 10-15 percent of the cement is lost in shipment at harbors in the Far North. This is at least 1,000 tons a year.

Many decrees have been adopted urging a change in the technology of shipping loose cargo. The organizations most interested in carrying out these orders, the Ministry of the Maritime Fleet and USSR Gossnab, have adopted many measures to this end. Specifically, the Dal'flot Association sends its own workers to industrial enterprises to help and instruct them in questions of stacking cargo and it refuses to accept unstacked cement. Unfortunately, this does not help much. The situation in the 1980 shipping season was worse than the year before.

Combined efforts are needed to solve shipping problems in the Arctic. This is the only way to improve the coordination of work by all types of transportation and the cooperation between shipping and other sectors of the economy, and to introduce improved shipping technology in mixed forms of transportation.

11,176
CSO: 1829/257

OCEAN AND RIVER

BRIEFS

'SIBIR'' ON DUTY-- Murmansk. This evening the nuclear powered "Sibir'" went into the Arctic. She is relieving the flagship of the nuclear icebreaker fleet, the "Lenin", which for several months has borne the ice watch in the Barents and Kara Seas. For three years now, practically without interruption, cargo ships have been operating on the route from Murmansk to Dudinka. This section of the Northern Sea Route, during the years of the 10th Five-Year Plan has become a most important main line along which, without fail, cargoes are being delivered to Noril'sk and the famous copper-nickle ores of Talnakh are being taken out to the mainland. At the 26th Congress of the CPSU it was proposed, in the new Five-Year Plan, to provide year around navigation in the whole western part of the Arctic up to the Vil'kitskiy straits. In this voyage the crew of the nuclear "Sibir'" together with other Murmansk shipping company icebreakers are to make the first step in the practical working out of that undertaking. [Text] [Moscow SOVETSKAYA ROSSIYA in Russian 4 Mar 81 p 4] 9136

RIVER PORTS OPEN-- The icebreakers "Sever", "Arktika","Taymyr", and "Polyarnyy" have gone from the river ports of Pinsk, Mozyr, Mikashevich and Gomel'. Forcing open the strong winter armor of the blue sea routes and accelerating the passage of the ice flow, they have opened navigation 10-12 days early. [Excerpt] [Minsk SOVETSKAYA BELOROSSIYA in Russian 22 Mar 81 p 4] 9136

NAVIGATION BEGUN--Leningrad. Navigation has begun on the Volga-Baltic Sea waterway imeni V. I. Lenin. The first caravan of motorships has passed along it substantially before the traditional time. The canal is operating despite complex ice conditions on lakes Ladoga and Onega and on the reservoirs. Powerful icebreakers have gone to these places on the route. The lengthened navigation period will permit a supplementary transportation of hundreds of thousands of tons of cargoes. [Text] [Moscow KRSNAYA ZVEZDA in Russian 5 Apr 81 p 1] 9136

HARBORS OF SIBERIA-- Leningrad. A large system of planned developments for the reequiping and expansion of Siberian river ports has beencompleted by specialists of Lengiprorechtrans [The Leningrad State Institute of Planning for River Transport]. In Krasnoyarsk, essentially, a new, modern, port will be created. The construction of four piers with a length of 400 meters is envisaged. According to the plans of the specialists from the shore of the Neva, several large piers have gone into operation in Severobaykalsk, and pier structures are being completed in the port of Baykal in the village of Kulchuk and Nizhneangarsk. "Our development plan" says the chief engineer of the project, V. Fedoseyev, "provided for the simultaneous use of the piers during their construction. During the period of their erection, several hundred thousand tons of different cargoes were delivered to the builders of the 'mainline of the century'. Twenty five associates of the institute were awarded medals for 'Construction of the BAM'" A large port is being built on the Lena river at the city of Ust'-Kut whence the BAM [Baykal-Amur Main line] originates. The new port will become the largest in this region of Siberia. A radical reconstruction of the port of Zelenomysskiy is scheduled. The port of Khabarovsk is experiencing a second birth. Here, the initial complex of a new freight district "Krasnaya Rechka" has been put into operation. On the Amur river, the oldcargo wharfs "Vetka" on the right shore and "Pokrovka" on the left,will be substantially expanded. [V. Alyushinskiy] [Text] [Moscow IZVESTIYA in Russian 18 Feb 81 p 6] 9136

END OF ANTARCTIC EXPEDITION-- When the diesel-electric ship "Kapitan Markov" left the White Continent, the ship's company was presented with a memorial medal struck in commemoration of the 25 years of Soviet explorations in the Antarctic. After a long voyage in the Southern Ocean, the ship is returning to the Motherland. The crew, led by Captain G. Matusevich, has completed the assignments of the 26th successive Soviet expedition. The tense transport operations into various regions of the coast of Antarctica, the ice and icebergs have been left behind. On the approaches to the sixth continent, meetings took place with the passenger motorships "Bashkiriya" and "Estoniya", the dry cargo ship "Pioner Onegi" and the tanker "BAM". We took on and disembarked polar research workers, unloaded hundreds of tons of equipment, supplies, and fuel on the ice piers of the Druzhnaya seasonal base and the Novolazarevskaya and Molodezhnaya permanent stations. [First mate E. Shmakov] [Text] [VODNYY TRANSPORT in Russian 4 Apr 81 p 4] 9136

TRANSPORT PROBLEMS-- A scientific operational conference took place in Irkutsk on the "Problems of the coordination of the transport industries of the Irkutsk oblast". Seventeen reports were heard including those of workers from the Osetrovskiy river port, the Vostochno-Sibirskiy river shipping company,and the Vostochno-Sibirskiy basin waterway administration. In the addresses there was talk about the favorable experience and the problems of introducing NPGRTU [expansion unknown] at the transportation terminal, about the possibilities of transferring a significant weight of freight on to the water in the region of the Ust'-Ilinsk timber industry, the Bratsk territorial production complex and Lake Baykal, and about the need for a long-term program for the development of river transport in the region which contemplates the prospect of creating a unified water transport artery along the Angara river, Lake Baykal, and the Selenga river. [Text] [VODNYY TRANSPORT in Russian 9 May 81] 9136

LIGHTER CARRIER-- For the first time, the staff of the Central Technical Design Bureau of the Ministry of th River Fleet have been entrusted with the design of a ship for operation on rivers and at sea. It will be a lighter carrier fitted with modern navigation equipment and having a 3,000 ton cargo capacity. The cargo lighters will be arranged in two tiers. Loading and unloading on the first tier will be accomplished by a docking system, the lighters will float in by themselves. Loading the second tier will be done with a special lift. [S. Roshchina] [Text] [LENINGRADSKAYA PRAVDA in Russian 23 Apr 81 p 4] 9136

NEW ASIAN LINE-- In April 1980 the international shipping enterprise "Interlikhter" opened a new line from the Danube to Southwest Asia. The new business was entrusted to the crew of the "Yulius Fuchik". On it work certified specialists such as chief engineer Khokhulya, senior mechanic and welder L. Boronenko, second mechanic A. Khmil', first electromechanic B. Yegorov, senior electrician V. Lepinskiy, and many others. The new route is being assimilated quickly and successfully. The affairs of the progressive collective are going well. The second lighter carrier "Tibor Samueli" at present operates on the line from the Danube to India and Pakistan. "Interlikhter" already is serving two international lines. [A. Levit] [Excerpt] [MORSKOY FLOT in Russian No 4 Apr 81] [COPYRIGHT "MORSKOY FLOT" 1981] 9136

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